Advancing Climate Observation: Radiometer Assessment using Vertically Aligned Nanotubes: Advancing Climate Observation: Radiometer Assessment using Vertically Aligned Nanotubes (RAVAN)

Completed Technology Project (2013 - 2017)

Project Introduction

Build and flight-qualify a radiometer using Vertically Aligned Carbon Nanotubes (VACNTs) as the absorbing material and fixedpoint gallium blackbody calibration transfer standard. Demonstrate the instrument's effectiveness for measuring the Total Outgoing Radiation (TOR) as a precursor to a CubeSat constellation Earth radiation imbalance measurement system. Verify that VACNT's electrostatic properties do not interfere with spacecraft or instrument electronics. Prototype a representative instrument for a constellation measurement systems concept

Anticipated Benefits

To measure Earths radiative diurnal cycle and absolute energy imbalance to climate accuracies.

Primary U.S. Work Locations and Key Partners

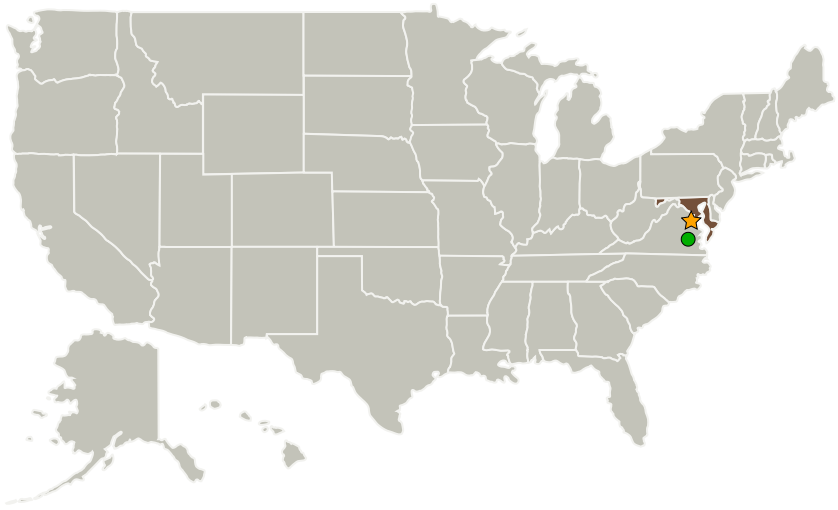

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Table of Contents

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Organizations Performing Work	Role	Type	Location
★NASA Headquarters(HQ)	Lead Organization	NASA Center	Washington, District of Columbia
Johns Hopkins University Applied Physics Laboratory(JHU/APL)	Supporting Organization	R&D Center	Laurel, Maryland
●Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations
Maryland

Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Lead Center / Facility:

NASA Headquarters (HQ)

Responsible Program:

Earth Science

Project Management

Program Director:

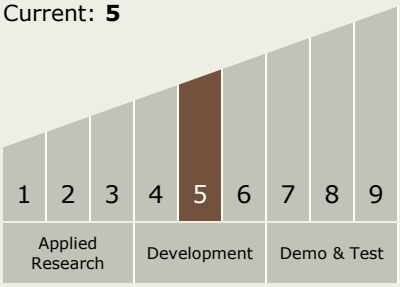
George J Komar

Principal Investigator:

William H Swartz

Technology Maturity (TRL)

Start: **5**
Current: **5**



Technology Areas

Primary:

Continued on following page.

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Completed Technology Project (2013 - 2017)

Technology Areas *(cont.)*

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destination

Earth